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CERTIFIED TRANSLATION CERTIFICATE TO ACCOMPANY GERMAN TO ENGLISH TRANSLATION OF THE ATTACHED PATENT

I, Laurie Finch, Owner and Translator of University Translators Services, LLC, (ATA NUMBER: 231264) attest to the fact and certify that this document has been officially translated into English from the German original as well as certify that the translation is true and accurate and that the translator is certified and competent.

Laurie Finch — November 22, 2004

Signature *Date*

Laurie Finch personally appeared before me on the 22nd day of November 2004 in Ann Arbor, Michigan, Washtenaw County, U.S.A.

Susan M. Otto

Susan M. Otto, Notary Public
State of Michigan, County of Washtenaw
Acting in the County of Washtenaw
My commission expires March 27, 2007

Any inquiries regarding the contents of this translation should be directed to:
Raquel Fleming or Laurie Finch
University Translators Services, LLC
220 N. Fifth Avenue
Ann Arbor, MI 48104
734/665-7295
734/665-1345 FAX

Electrically insulated fastening arrangement for an airbag module

Description

The invention relates to a fastening arrangement for an airbag module in motor vehicles, wherein the gas generator is fastened by means of at least one stay bolt and nut screwed thereupon, the bolt being designed for the gas generator and penetrating through at least one hole of a retaining member that serves for mounting the airbag module and fastening to a vehicle part.

This type of fastening arrangement is described in US 5 803 486 A for an airbag module fastened to a car seat, wherein stay bolts, which pierce the wall of a post as member of the seat structure and are fastened thereto by nuts screwed upon them, are attached to the gas generator housing. To the extent that, in this application in the car seat, still other electrically operated and controlled components, like retractor, seatbelt tensioner and the like, are arranged and

preferably fastened to the integrated seat structure, the problem can appear in the known fastening arrangement for an airbag module, that sufficiently strong electrical currents flow to the gas generator and to its ignition mechanism across the seat structure and the stay bolts of the gas generator fastened thereon so that a spurious release of the gas generator cannot be excluded with the required certainty. Since these types of spurious releases at ill times can have severe consequences for the vehicle occupants, it is the objective of the invention to so design a fastening arrangement of the aforementioned art that spurious release is prevented.

The solution of this objective, including advantageous embodiments and developments of the invention, is achieved by the content of the claims, which follow this description.

In its basic idea, the invention provides that an electrical insulation be provided between gas generator and vehicle part. In an advantageous manner, it is thereby precluded that arising electrical currents can reach the gas generator and its ignition mechanism across the fastening arrangement. Here the electrical insulation provided forms a line trap.

In a first embodiment, the invention for designing the electrical insulation provides that a shell, which is made of an electrically insulating material

and engages the hole of the retaining member with at least one shoulder and forms an insulation between the stay bolt and the hole edge of the retaining member, which surrounds the stay bolt, is arranged extending at least across the contact area between gas generator and retaining member, and that a bushing made of an electrically insulating material is arranged on the retaining member between the nut screwed on the stay bolt and the bearing surface of the nut. If the shell insulating the contact surface between generator and retaining member reaches through the hole of the retaining member with a shoulder, then the stay bolt is also insulated from the retaining member in an advantageous manner. The insulation of the nut from the retaining member takes place through the bushing inserted therebetween.

For this, it is additionally provided according to one exemplary embodiment, that the shoulder of the shell demonstrates a hook-like radial projection lying on the external side of the retaining member facing away from the gas generator. Preferably it is also provided that the shoulder of the shell having the hook-like projection is designed resilient and locks with the vehicle part when pushed through the hole of the retaining member. Easier assembly is associated with this type of solution.

According to one exemplary embodiment, the invention provides that the radial projection of the shoulder forms a support for the bushing. Alternatively, it may be provided that the bushing engages the projection externally and that its edge lies fully on the retaining member, wherein the inner surface of the bushing engages the projection and the

outer surface of the projection may be designed as slanted surfaces that correspond to each other.

An appropriate plastic is preferably used as electrical insulation.

To the extent that it is possible for an electrical charge to appear on the airbag module and no longer be able to automatically discharge itself against the conducting vehicle part because of insulation undertaken according to invention, it is provided according to one exemplary embodiment of the invention, that a compound-impregnated cable connects the stay bolt to an electrically conducting vehicle part, so that a static charge in the vicinity of the airbag module is likewise excluded.

According to one exemplary embodiment of the invention, it is provided that the retaining member serving to fasten the airbag module is fastened to the structure of a car seat. The invention is nevertheless equally applicable to installation situations of airbag modules in which the airbag modules having the integrated retaining member are fastened outside the car seat, such as to electrically conducting vehicle parts in the vicinity of the instrument panel. Moreover, the invention is not necessarily restricted to the inclusion of a retaining member, but it may rather also be provided that the stay bolts of the gas generator or generator housing are guided directly through holes provided in a vehicle part serving for fastening the airbag module, and that the fastening occurs by means of

nuts screwed onto the stay bolts, as is described in the principle in US 5 803 486 A, which forms the prior art.

The drawing depicts an exemplary embodiment of the invention, which is described below. The drawing shows:

Fig. 1 sectional view of an airbag module having retaining member,

Fig. 2 the connection of gas generator and retaining member in an exploded cutout representation.

The airbag module 10 depicted in Fig. 1 demonstrates two outer housing halves 11, which are placed and held together by a hinged connection 14 on their one end and a snap connection 12 at their opposite end. One of the two housing halves 11 is provided with a predetermined breaking point 13, which is destroyed by the inflation pressure of the gas bag 16 arranged in the airbag module 10, so that one of the housing halves 11 opens itself pivoting around the hinged connection 14.

A gas generator 15 and a folded gas bag 16 are arranged in the interior of the airbag module 10. The gas generator 15 is fastened by a stay bolt 18, which is arranged thereon and pierces a retaining member 17 extending into the inside of the airbag module 10, owing to a nut 22,

which screws onto the respective stay bolt 18. The retaining member 17 extends beyond the airbag module 10 and features both a mounting hook 20 and a mounting hole 21 at its end, so that the retaining member 17 fastens to a vehicle part, for example a section of the seat structure as presented in US 5 803 486 A, which forms the prior art, by means of a suitable fixing agent.

In order to prevent an electrically conducting connection from the vehicle part or possibly a seat structure to the gas generator and its ignition mechanism across the retaining member 17 and the fastening arrangement for the gas generator 15, the fastening arrangement consisting of stay bolt 18 and nut 22, a shell 23 made of an electrically insulating material, preferably a suitable plastic, is arranged in the seating area of the gas generator 15 against the retaining member 17 between gas generator 15 and retaining member 17, the shell likewise insulating the stay bolt 18 and being supplemented by a bushing arranged between nut 22 and retaining member 17.

The electrical insulation in the vicinity of the stay-bolt fastening is depicted in detail in Fig. 2. Here it is evident that the shell 23, which has a shoulder 24 surrounding the stay bolt 18 and is arranged between retaining member 17 and gas generator 15, pierces the hole 30 designed in the retaining member 17 and engages the retaining member 17 hook-like on the side facing away from the gas generator 15 with a radial projection 25 that is directed outwards. This organization

ensures that the faces of the retaining member 17 pointed toward the stay bolt 18 in the vicinity of the hole 30 are also protected and insulated from the stay bolt, so that no electrically conducting connection can arise here.

If a nut 22 is screwed onto the stay bolt 18 for fastening purposes, a bushing 26, which is likewise made of electrically insulating material, is also arranged between the nut 22 and the retaining member 17, so that the nut 22 supports itself on the bushing 26 and a conducting connection between the nut 22 and retaining member 17 is prevented. In the embodiment depicted in Fig. 2, the inner surface 28 of the bushing 26, which engages the projection 25, and the outer surface 27 of the projection 25, are both designed in the same manner as a slanted surface that corresponds to the opposite slanted surface.

The arrangement of shell 23, shoulder 24 and projection 25 is preferably so made, that a locking snap connection results between shell 23 and retaining member 17 during the assembly of the shell 23 to the retaining member 17.

To prevent electrostatic charging of the gas generator, a compound-impregnated cable 31 connects the stay bolt 18 to an electrically conducting vehicle part, so that the electrical isolation

between the vehicle part and/or the retaining member connected thereto and the gas generator is bridged thereby.

The characteristics of the object of these documents disclosed in the present description, the claims, the abstract and the drawing may be essential for the realization of the invention in its various embodiments both individually and in arbitrary combinations with each other.